

Iowa's Frog and Toad Call Survey

2013



Introduction and Background

The first volunteer based frog and toad call survey in Iowa took place in 1984 but it did not become a permanent yearly event until 1991. Iowa was one of the earliest states to adopt this survey, which was developed in Wisconsin in response to alarm in the conservation community regarding amphibian declines. These alarm bells have only grown louder over the past 23 years of the survey and this long-term dataset is more important than ever.

From 1991-2009 Iowa's frog and toad survey followed a traditional model based on Wisconsin's survey. Volunteers chose 5-8 quality wetland sites and then visited each of these sites at night three times during the frog and toad breeding season. Volunteers listen and identify all species by their unique call. Each species they hear is assigned an abundance index: 1 for a few individuals, 2 for a moderate number of individuals, some overlapping calls, and 3 for a full chorus. The listening time period was initially 10 minutes but in the last 4 years has been reduced to 5 minutes at each stop and environmental variables such as air and water temperature, cloud cover, wind and time since rain are also recorded.

Starting in 2010, Iowa adopted a second frog and toad survey protocol following guidelines from the North American Amphibian Monitoring Program (NAAMP) coordinated by the U.S. Geological Survey. NAAMP was initiated in the mid-1990's with a purpose of helping standardize frog and toad survey methodologies across state lines. The NAAMP protocol is based on the original survey developed in Wisconsin and the USGS Breeding Bird Survey. The main difference with the traditional is that NAAMP is run on previously established 10-stop long randomly placed routes. The routes are run at the same time and in the same way with most of the information being collected overlapping with the traditional routes.

Both of these monitoring protocols are important to monitoring Iowa's anuran populations. Each provides complementary data, with the traditional survey likely biased towards higher quality sites while the NAAMP routes hit a mix. Currently we are focused on recruiting volunteers for the 85 NAAMP routes in Iowa but we definitely intend to continue the traditional survey and potentially add new routes in the future. Below, 2013 data are presented separately for each survey type.

Traditional Survey Results

Data was reported for 80% (41) of the active routes in the traditional survey. This translated into 219 sites visited a total of 605 times (# of sites X # of surveys) (Table 1). The average weather conditions were well within the parameters of the survey. The percentage of surveys done within 24 hours of a rain event was higher in 2013 with 36% compared to 20% in 2012. Run two had the highest number of surveys performed within 24 hours of rain.

The Boreal Chorus Frog was the most detected species on the surveys followed by the Eastern Gray Treefrog and American Toad. All three of these species also had a high average abundance index though chorus frog, cricket frog and spring peeper had the highest at greater than or equal to 2 (out of 3). The number of species not detected anywhere on the survey was seven: Fowler's toad, Plains Spadefoot, Pickeral Frog, Great Plains toad, Southern Leopard frog, Wood Frog, and Crawfish frog (Table 2). The first five species on this list are frequently not reported because of several factors such as limited distribution, rarity and episodic breeding.

There are 10 species that are detected at high enough rates that trends can be reliably identified. All of the species in the Hylidae family (tree frogs, fig. 1) had a level or increasing trend from 2012 to 2013 as did the Northern Leopard Frog. Early breeders likely did well as the spring of 2013 was very wet. Bullfrog and Green frog decreased slightly which would be expected after many usually permanent wetlands dried up in 2012. Both of these species require permanent water sources as they are fully aquatic tadpoles for two years. American toads also decreased slightly while the rest of the toads increased slightly or stayed the same. Examining data for the last 10 years shows that most species are highly variable from year to year but have an overall flat trend (Figure 1). Spring Peeper had been exhibiting a bit of a negative trend but it has flattened out in the last four years.

NAAMP Survey Results

Fifty-two out of a total of 85 available Iowa routes were assigned to a volunteer. Data was reported for 71% of the routes assigned (37 routes), though fewer (33 routes) were surveyed all three times during the breeding season. This level of participation is a slight decrease from 2012 when 72% of assigned routes were surveyed.

Fifteen out of Iowa's 18 species listed in NAAMP were heard by volunteers. It is worth noting that there are a few differences between the way NAAMP and the traditional survey track each species. The NAAMP survey combines Fowler's and Woodhouse's toad into one category, because these two species are hard to distinguish. There is a category added for unknown tree frogs, as Cope's and Eastern Gray Tree Frogs are difficult to tell apart. Pickeral frog, Great Plains Toad, and Southern Leopard frog were all species picked up on the NAAMP surveys that were not heard on the traditional survey.

The four most commonly heard species across all sites and runs was the same for both traditional and NAAMP surveys (Boreal Chorus Frog, American Toad, Eastern Gray Treefrog, and Cricket Frog) though the order was slightly different. Chorus frog, Great Plains Toad and Cricket Frog all had an average call index over two meaning that where they were found they were frequently fairly abundant. No species occurred on all 370 sites surveyed though Chorus Frogs were heard on 75% of these sites and American Toads were heard on 64% (Table 2 and 2a).

Both NAAMP and traditional data had a similar overall trend from 2012 to 2013 which for most species was positive. Looking at specific species, there are some notable differences with the cricket frog having a negative trend in NAAMP versus a positive trend in the traditional survey and Green frog increased in NAAMP (Table 2A, Figure 2).

Conclusions

Overall, 2013 seemed to be a positive year for species activity and production, especially for the smaller, more generalist species like Chorus frog and the gray tree frogs. Species with a two year life cycle, like Bull frog and Green frog, exhibited a down turn likely because of the summer drought in 2012, but the decreases exhibited were not dramatic and the green frog actually showed an increase on the NAAMP survey. The simple long term trends in wetland occupancy, for most species, seems to be highly variable from year to year but basically steady overall. The two types of surveys (NAAMP and Traditional) continue to complement each other and provide crucial information in monitoring our frogs and toads and wetlands.

In the Coming Year

We have one nighttime training workshop schedule this spring in O'Brien County on April 16th. The workshops recruit and train additional volunteers to assist with the survey. If you are interested in getting involved you can find more details on how to register at www.iowadnr.gov/volunteerwildlifemonitoring/.

Acknowledgements

As always we'd like to acknowledge the amazing volunteers who donate their time to this survey and to Iowa's wildlife as a whole. It is no easy task to find three nights during the summertime when the weather is just right to go listen to frogs. This is a truly amazing and inspiring group of people! Thank you!

Participation Data

Table 1 Traditional Survey: 2013

Num. of Active Routes	51
Num. of Routes Run in 2013	41 (80%)
Num. of Active Sites	284
Num. of Sites Run in 2013	219 (77%)
Total Num. of Visits Made in 2013	605
Total Num. of Counties Surveyed	25
Num. of Empty Sites (no frogs heard all 3 runs)	2

Table 1a. NAAMP Survey 2013 Participation Data, n = 85 total routes available in Iowa

Num. of Routes Assigned	52 (61% of 85)
Num. of Routes Run	37 (71% of 52)
Num. of Sites Run	370 (71% of 520)
Total Num. of Surveys conducted	123
Number of routes where all 3 runs conducted	33 (89% of 37)

Species Data

Table 2 Traditional Survey: 2013 Frog and Toad Survey species data

Number of records per run
(count of the num. of surveys during
which species was detected)

<i>Species</i>	<i>Sites on which species detected</i>	<i>% of Total Possible Sites</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>Total Num. Visits</i>	<i>Average call index 1=Single to 3=Full Chorus?</i>
Chorus Frog	157	71.7%	139	85	7	231	2.22
Eastern Gray Treefrog	136	62.1%	24	116	78	218	1.97
American Toad	114	52.1%	78	47	42	167	1.78
Cricket Frog	110	50.2%	6	64	97	167	2.15
Northern Leopard Frog	71	32.4%	60	25	6	91	1.46
Bull Frog	68	31.1%	2	10	66	78	1.29
Spring Peeper	53	31.2%	42	26	0	68	2.00
Green Frog	36	22.0%	3	10	31	44	1.45
Cope's Gray Treefrog	44	20.1%	2	29	31	62	1.58
Plains Leopard	3	4.1%	0	2	1	3	1.3
Leopard Frog	7	3.1%	4	2	4	10	1.0
Woodhouse's Toad	1	3.0%	0	0	1	1	1.0
Great Plains Toad	0	0.0%	0	0	0	0	NA
Plains Spadefoot	0	0.0%	0	0	0	0	NA
Pickeral Frog	0	0.0%	0	0	0	0	NA
So. Leopard Frog	0	0.0%	0	0	0	0	NA
Wood Frog	0	0.0%	0	0	0	0	NA
Crawfish Frog	0	0.0%	0	0	0	0	NA
Fowler's Toad	0	0.0%	0	0	0	0	NA

Table 2a. NAAMP Survey: Species Detection for 2010 through 2013

<i>Species</i>	<i># of Sites (%*)</i>				<i>Change in % sites from 2012- 2013</i>	<i>Total Num Visits</i>	<i>Avg. Call Index (Max= 3)</i>
	2010	2011	2012	2013			
Chorus Frog	193(67)	155(65)	187 (52)	278 (75%)	+23	466	2.06
American Toad	182(63)	132(55)	205 (57)	238 (64%)	+7	384	1.76
Eastern Gray Treefrog	134(46)	120(50)	153 (43)	179 (48%)	+5	308	1.85
Cricket Frog	127(44)	108(45)	201 (52)	175 (47%)	-5	299	2.26
Spring Peeper	34(19)	39(26)	72 (29)	83(29%)	0	104	1.68
Cope's Gray Tree frog	59(20)	66(28)	61 (17)	96 (26%)	+9	141	1.52
Bull Frog	42(15)	49(20)	111 (31)	83(22%)	-9	106	1.12
Unknown Tree frog	21(7)	11(5)	22 (6)	69 (19%)	+13	100	1.71
Green Frog	21(12)	32(25)	32 (13)	32(17%)	+4	45	1.09
Northern Leopard Frog	34(12)	33(14)	47(13)	60 (16%)	+3	74	1.31
So. Leopard Frog	0(0)	3(30)	0 (0)	4(15%)	+15	5	1.4
Great Plains Toad	2(7)	3(15)	4(10)	3(14%)	+4	5	2.4
Plains Leopard	18(13)	5(4)	11 (6)	21(10%)	+4	35	1.17
Woodhouse/Fowlers	5(13)	6(15)	7(12)	3(3%)	-9	4	1.5
Pickeral Frog	0(0)	0(0)	1 (1)	1(1%)	0	1	1
Plains Spadefoot	1(3)	0(0)	2 (5)	0(0)	0	0	0
Wood Frog	0(0)	0(0)	0 (0)	0(0)	0	0	0
Crawfish Frog	0(0)	0(0)	0(0)	0(0)	0	0	0

* Percent listed in percent of potential sites for each species. EX: For species with a statewide distribution the total number of potential sites in 2012 with 36 routes run = 360, For species with a limited distribution the number of total potential sites is limited by routes in counties where they occur. These are: Great Plains toad= 21; Pickeral Frog = 89; Green Frog = 187; Woodhouse's/Fowler's = 95; Plains Leopard = 201; Spring Peeper = 290; Plains Spadefoot = 21.

Figure 1. Ten year trends for frog and toad data collected as part of Iowa's traditional call survey.

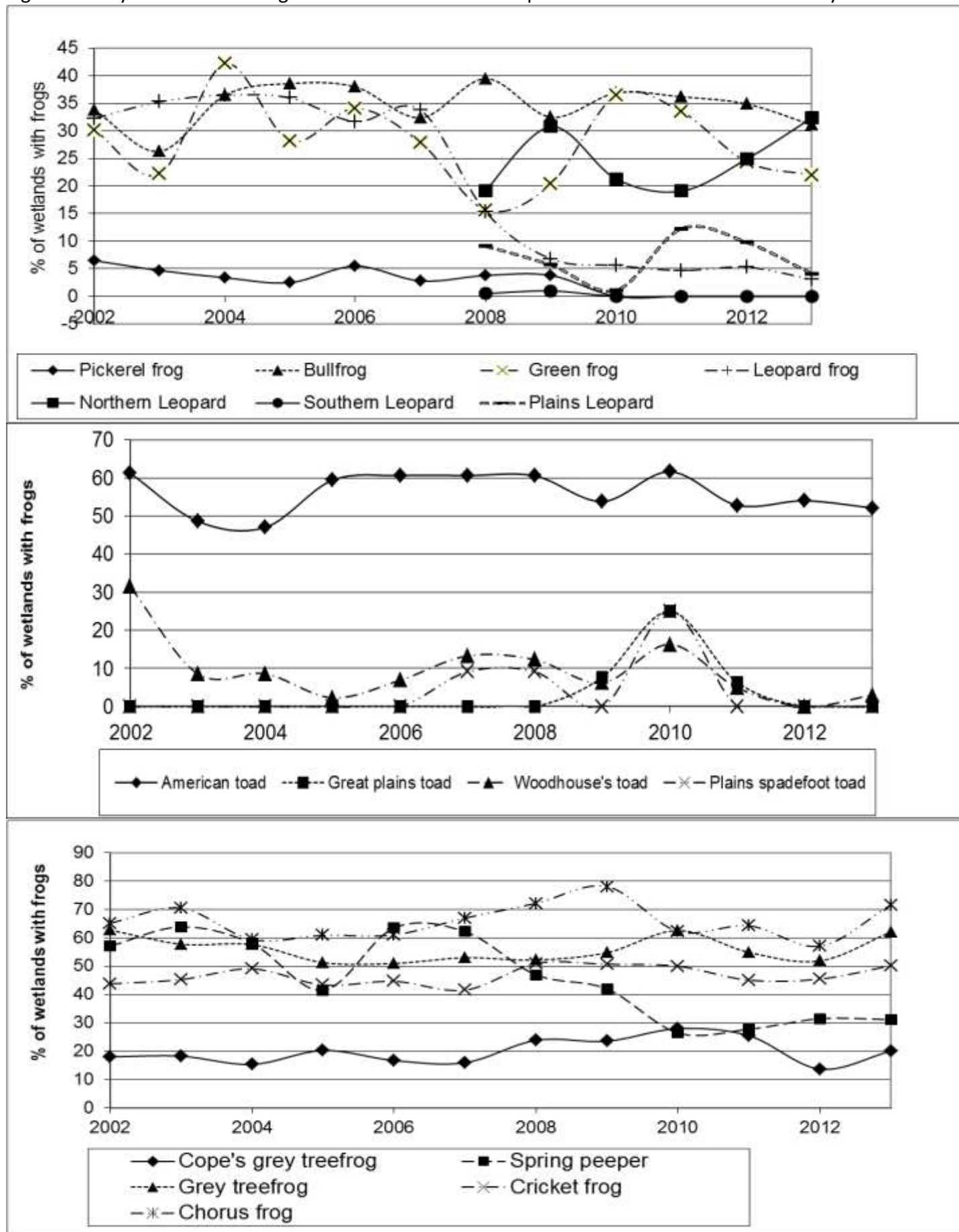


Figure 2. Three year trend in surveyed wetland occupancy with data collected in Iowa's NAAMP survey

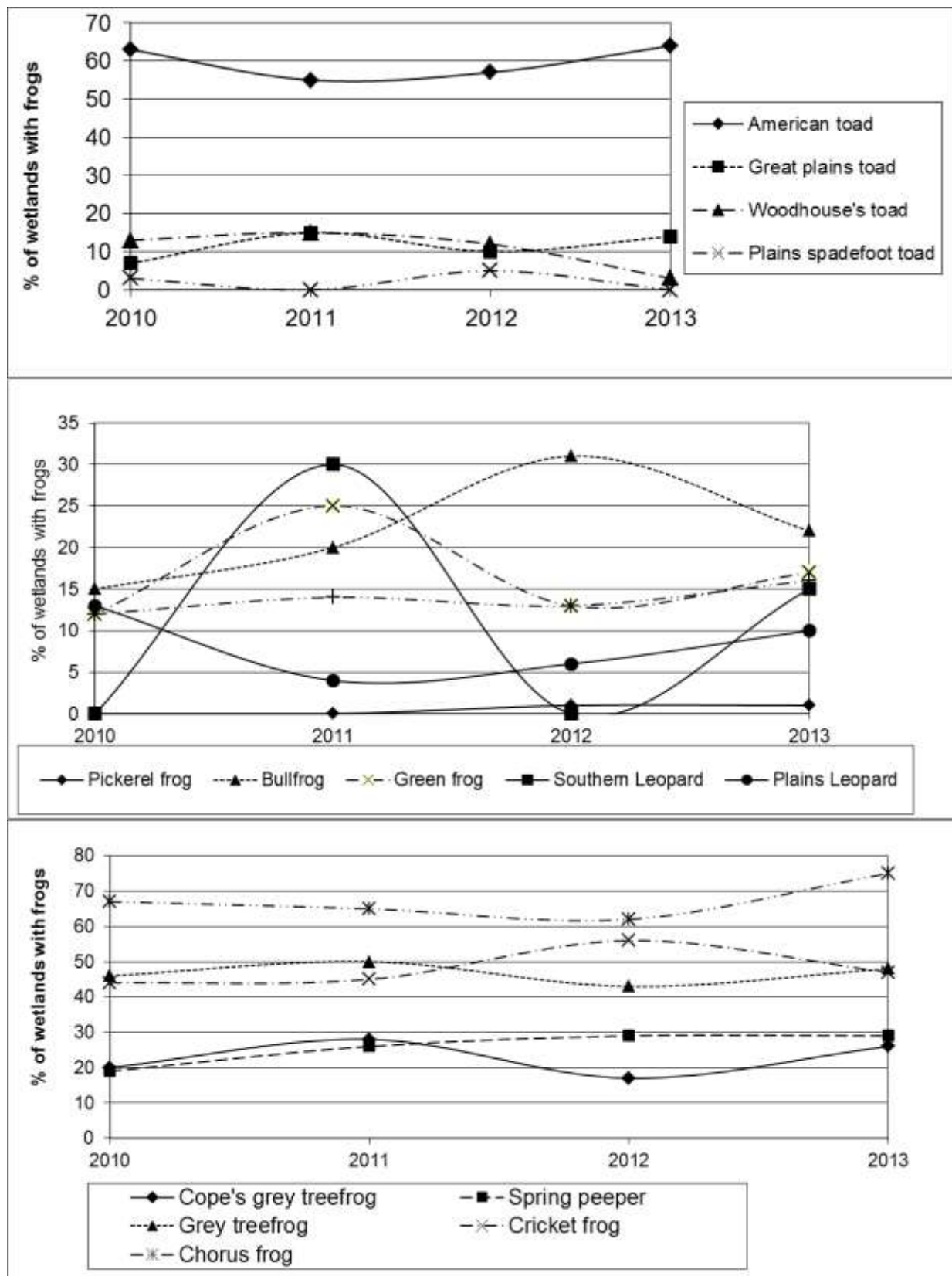


Figure 3. Map of Routes Performed

